Claims of Patent

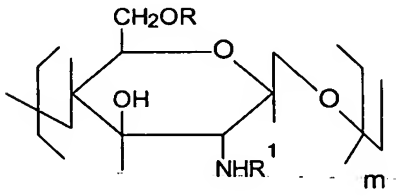
Claim 1. A kind of chelator compound of heavy metals containing chitosan (CTS) derivatives, which contains the following contents:

Components	Content (wt%)
at least one dithio-formate (dithiocarbamate) CTS derivatives	1-100
at least one dithio-formate (dithiocarbamate) polyamine derivatives	0-99

Claim 2. According to Claim 1, the described CTS derivatives that carry at least one dithio-formate (dithiocarbamate) means that the CTS derivatives' all sugar rings at the 2- carbon amino or the 6- carbon of hydroxyl contains at least one dithio-formate (dithiocarbamate).

Claim 3. According to Claim 1, the described polyamine derivatives that carry at least one dithio-formate (dithiocarbamate) means that the polyamine derivatives' amino of the polyamine contains at least one dithio-formate (dithiocarbamate).

Claim 4. According to Claim 1, the described CTS derivatives that carry at least one dithio-formate (dithiocarbamate) has the general structural formula I:



Where:

R : H or  (X: Na, K, NH_4, 1/2Ca, 1/2Mg)

R' :H,  or  (X: Na, K, NH_4 , 1/2Ca, 1/2Mg)

m: an integer in the range of 10~100000.

Claim 5. According to Claim 1, the described polyamine derivatives that carry at least one dithio-formate (dithiocarbamate) has the general structural formula III:

$$R^3R^4N\ [(R^2)_n\ (CH_2)_p\ NR^5]\ q$$

(General structural formula III).

Where: R^2 is aromatic ring and/or aliphatic ring,
R^3, R^4 and R^5may or may not be the same, they each indicate H or

but the contrain is R^3, R^4 and R^5 cannot be H simultaneously. n is an integer of 0 or 1; p is an integer in the range of 0-10; q is an integer in the range of 1-10000.

Claim 6. According to Claim 1 or Claim 2, the described CTS derivatives are the chitosan (CTS), oligosaccharide and chitin derivatives with molecular weight greater than 500.

Claim 7. According to Claim 1 or Claim 3, the described polyamine derivatives that carry at least one dithio-formate (dithiocarbamate) means that the polyamine derivatives' amino of the polyamine derivatives contains at least one dithio-formate (dithiocarbamate). The molecular weight of the polyamine mentioned in this invention is less than 500.

Claim 8. According to Claim 1 or Claim 2, the described CTS derivatives are the chitosan (CTS), oligosaccharide and chitin derivatives carrying one or more sodium dithiocarbamate, potassium dithiocarbamate, ammonium dithiocarbamate, calcium dithiocarbamate, magnesium dithiocarbamate.

Claim 9. According to Claim 4, the functionality of the described CTS derivatives is in the range of 0.1and 1.0mmol/g.

Claim 10. According to Claim 1 and Claim 3, the described polyamine derivatives that carry at least one dithio-formate (dithiocarbamate)

especially means that the polyamine derivatives contains carrying one or more sodium dithiocarbamate, potassium dithiocarbamate, ammonium dithiocarbamate, calcium dithiocarbamate, magnesium dithiocarbamate.

Claim 11. According to Claim 5, the described polyamine derivatives that carry at least one dithio-formate (dithiocarbamate) means that the functionality is in the range of 1.0 and 1.5mol/mol.

Claim 12. A kind of process for the treatment of wastewater containing heavy metal ions, the described CTS derivatives of the heavy metals chelate compounds in Claim 1 is mixed with the described wastewater.

Claim 13. A kind of process for the treatment of waste mud containing heavy metal ions, the described CTS derivatives of the heavy metals chelate compounds in Claim 1 is mixed with the described waste mud.

Claim 14. A kind of process for the treatment of burned ash containing heavy metal ions, the described CTS derivatives of the heavy metals chelate compounds in Claim 1 is mixed with the described garbage burned ash.

Claim 15. A kind of process for the treatment of soil polluted by heavy metal ions, the described CTS derivatives of the heavy metals chelate compounds in Claim 1 is mixed with the described soil polluted by heavy metal ions.